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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/524,298
Filing Date: July 28, 2005
Appellant(s): GAECHTER, JEAN-PIERRE

John S. Egbert
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed May 17, 2010 appealing from the Office action mailed May 18, 2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 53-66.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2004/0093973	Halasy-Wimmer	5-2004
6,101,889	Laskey	8-2000
5,358,265	Yaple	10-1994
4,138,902	Brusasco	2-1979
2,756,609	Hogan	7-1956
2,299,785	Barrett	10-1942

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 53-59 and 61-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan, USP 2,756,609, in view of Brusasco, USP 4,138,902 and further in view of Barrett, USP 2,299,785.

Hogan discloses an actuator comprising:

- An outer tubular body (34) [claim 53]
- An inner tubular body (21/22) having a portion positioned inside said outer tubular body (34) [claim 53]
- a nut assembly (between 31 and 32) interconnected to said inner tubular body (21/22), said nut assembly (between 31 and 32) having at least one helical ball race (opposing faces 36 make race) having a helical portion extending circumferentially for less than 360 degrees around said nut assembly (length of 36 connecting the two ends of 39), said helical ball race (36) having a widened portion (at 39) connecting to a first end and a second end of said helical portion (36), said nut assembly further comprises a plurality aligned elements (each disk 28) each of a cylindrical shape (see Figure 7) with at least one bevel (36) forming a helical cam surface, the helical cam surfaces (36) adjacent aligned elements (28) of said plurality of aligned elements defining the helical ball race [claim 53]
- a plurality of balls (38) received between the helical ball race (36) and an inner surface of said tubular body (34) [claim 53]
- said widened portion (39) defining a re-circulation zone (moves the balls between the two ends of the race) for the balls (38) [claim 53]
- a driving means (20/21) cooperative with said nut assembly (between 31 and 32) for rotating the nut, in order to ensure the displacement in translation of the tubular body (34) with respect to the nut the inner face of

the first tubular body comprises helical ball-races for guiding the balls
[claim 53]

- wherein at least one helical ball race comprising a plurality ball races (one between each disk 28), the recirculation zones (39) for the balls of said plurality of ball races are not aligned in a direction of displacement of the actuator [outer tubular body] (the mating re-circulation zone of the next disk is offset and therefore not aligned in a direction of translation) [claim 55]
- wherein the ball races are evenly angularly disposed about the direction of displacement (since the re-circulation zones are not in a line they are regularly angularly distributed in so much as there angular pattern/location is predictable making the ball races evenly disposed as well, see Figure 2) [claim 56]
- wherein the ends of each helical cam surface (36) defines a setback (at 39), a pair of aligned elements (28) being positioned with respect to each other such that the setbacks (39) are facing each other, said setbacks (39) defining the recirculation zone for the balls (38) (see Figure 2) [claim 57, 62]
- wherein said plurality of aligned elements (28) are tightenable with respect to each other (clamped together by spring 33 and nut 24) [claim 58]
- a nut member (24) cooperative with said plurality of aligned elements (28) so as to adjust the tightening of the elements (28) [claim 59]

- each of said plurality of aligned elements (28) having a cross-section with a beveled circular edge (36), the helical cam surface being inclined relative to an axis of said cylindrical shape, the helical cam surface having ends connected by a setback (39) surface of a generally conical shape [claim 61]
- wherein the helical ball races in the inner surface of the outer tubular body (34) are formed by plastic distortion of said plurality of balls (balls press against inner side of outer tube) [claim 63]

Hogan does not disclose that the first tubular body comprises a helical ball race formed on an inner surface thereof so as to be suitable for guiding said plurality of balls and the race is substantially equal to the helical pitch of a ball race of the nut. [Claims 53, 54]

Brusco teaches a first tubular body (15) that comprises a helical ball race (for balls 4) formed on an inner surface thereof (15 is a block attached to the inner surface which makes the grooves "formed on", this arrangement is similar to the inserts shown in Applicants drawings) so as to be suitable for guiding said plurality of balls and the race is substantially equal to the helical pitch of a ball race of the nut for the purpose of assuring the pitch movement of the balls and the moving body are correct (C1/L48-52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hogan and provide the first tubular body with a helical ball race formed on an inner surface thereof so as to be suitable for guiding said

plurality of balls and the race being substantially equal helical pitch of a ball race of the nut, as taught by Brusasco, for the purpose of assuring the pitch movement of the balls and moving body are correct.

Hogan and Brusasco disclose all of the claimed subject matter as disclosed above. Hogan further discloses that the drive means is a motor (20). [claim 53]

Hogan and Brusasco do not disclose that the motor is mounted fixed inside a second tubular body being drivable in translation with respect to the first tubular body. [Claim 53]

Barrett teaches a motor (20) that is mounted fixed inside a second tubular body (11) being drivable in translation with respect to the first tubular body (17) for the purpose of providing an actuator that has a low manufacturing cost, simply construction and an extremely low capacity coupling with ground with a high leakage resistance to ground (C1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hogan in view of Brusasco and provide a motor that is fixed inside a second tubular body being drivable in translation with respect to the first tubular body, as taught by Barrett for the purpose of providing an actuator that has a low manufacturing cost, simply construction and an extremely low capacity coupling with ground with a high leakage resistance to ground.

Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan '609 in view of Brusasco '902 and Barrett '785.

Hogan in view of Brusasco discloses all of the claimed subject matter as applied above. Hogan further discloses the use of a spring (33).

Hogan in view of Brusasco does not disclose that the spring is between the nut and the aligned elements.

It would have been obvious to one having ordinary skill in the art to arrange the spring between the nut and the aligned elements since rearranging the location of the spring would have been obvious to try and would still yield the predictable result of subjecting the balls to a radial thrust against the outer tube (c2/l64-70). If the spring is located at the end of the nut assembly or between the nut and the aligned elements in Hogan the function of the spring does not change.

Claim 64 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan '609 in view of Brusasco '902 and Barrett '785 and further in view of Halasy-Wimmer, US PGPub 2004/0093973.

Hogan in view of Brusasco and Barrett discloses all of the claimed subject matter as disclosed above.

Hogan in view of Brusasco and Barrett does not disclose an interior tube within the outer tubular body, the interior tube comprising the ball-races.

Halasy-Wimmer teaches an interior tube (8) arranged in the tubular body (9), the interior tube (8) comprises the ball-races for the purpose of providing a device with a

considerable reduction in manufacturing costs due to non-cutting fabrication (paragraph 0004).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hogan in view of Brusasco and Barrett and provide an interior tube arranged in the outer tubular body, the interior tube comprising the ball-races, as taught by Halasy-Wimmer, for the purpose of providing a device with a considerable reduction in manufacturing costs due to non-cutting fabrication.

Claim 65 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan '609 in view of Brusasco '902 and Barrett '785 and further in view of Yaple, USP 5,358,265.

Hogan in view of Brusasco and Barrett discloses all of the claimed subject matter as disclosed above.

Hogan in view of Brusasco and Barrett does not disclose another tubular body, the outer tubular body being connected to another nut, rotation of the another nut causing the displacement in the translation of the another body with respect to the outer tubular body.

Yaple teaches a multiple tube system comprising an additional tubular body (16c), a first tubular body (16b) being connected to a second nut (72 on 16c), rotation of the second nut causing displacement in the translation of the additional body (16c) for the purpose of providing an actuator comprising at least three telescoping members which allows for additional length of actuation (C4/L1-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hogan in view of Brusasco and Barrett and provide another tubular body, the outer tubular body being connected to another nut, rotation of the another nut causing the displacement in the translation of the another body with respect to the outer tubular body, as taught by Yaple, for the purpose of providing a device with a considerable reduction in manufacturing costs due to non-cutting fabrication.

Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hogan '609 in view of Brusasco '902 and Barrett '785 and further in view of Laskey, USP 6,101,889.

Hogan in view of Brusasco and Barrett discloses all of the claimed subject matter as disclosed above.

Hogan in view of Brusasco and Barrett does not disclose that the outer tubular body is made of aluminum, KEVLAR, carbon fibers or molded plastic.

Laskey teaches a tubular body made of aluminum (C3/L8-19) for the purpose of providing a material suitable for the load.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Hogan in view of Brusasco and Barrett and provide for the outer tubular member being made out of aluminum, as taught by Laskey, for the purpose of providing a material suitable for the load being handled.

(10) Statement of Facts

The Appellant lists that an appeal was withdrawn and an RCE was filed on January 28, 2009. This is an error since no appeal was filed in the case prior to the current appeal dated November 30, 2009.

(11) Response to Argument

Appellant first argues in section II subsections A-D that there is no "explanation as to why the claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made" and therefore no prima facie case of obviousness has been made.

Regarding subsection A, explanations of the combinations being made have indeed been provided to the Appellant. In the first teaching, Brusasco, the explanation of why one of ordinary skill would be motivated to add defined grooves to Hogan is stated as "for the purpose of assuring the pitch movement of the balls and the moving body are correct" (as found in the disclosure of Brusasco, C1/L48-52). In the second teaching, Barrett, the explanation of why one of ordinary skill would be motivated to add a motor inside the tubular body of Hogan is stated as "for the purpose of providing an actuator that has a low manufacturing cost, simply construction and an extremely low capacity coupling with ground with a high leakage resistance to ground" (as found in the disclosure of Barrett C1). The Appellant as points out that the identical terminology used in the claims is not used in the formulation of the teaching references in the rejections under 35 USC 103. In response to these statements the Appellant is directed to the rejection above and the prior final office action where the primary reference is relied upon for the disclosure of the "outer" and "inner" tubes. The teaching references

are only being relied upon to teach thread arrangements on tubular bodies or locations of motors in an actuator assembly not the specific "outer" and "inner" tubular bodies found in the Hogan reference. The language used in the rejection is not required to match the language verbatim and one reading the rejection with the prior art in hand would understand that Brusasco is being used to teach a thread to a tubular body, to the outer body of Hogan, and Barrett is being used to teach a motor location in an actuator to the Hogan reference.

Regarding subsection B, explanations of the combination being made has indeed been provided to the Appellant. In the teaching in the rejection of claim 64, Halasy-Wimmer, the explanation of why one of ordinary skill would be motivated to add an interior tube as part of the outer tube body, the inner tube having the ball race to Hogan is stated as "for the purpose of providing a device with considerable reduction in manufacturing costs due to non-cutting fabrication" (as stated in Halasy-Wimmer paragraph 0004). The use of a preformed insert to create the races, either by molding, casting or other method (the method of which it is formed is a product-by-process limitation which does not alter the final structure, see MPEP 2113) allows for the device to be made and assembled quickly with having to machine an inner surface of the outer tube body (in the case of Halasy-Wimmer, 9), the removal of a requirement for internal machining reduces manufacturing costs.

Regarding subsection C, explanations of the combination being made has indeed been provided to the Appellant. In the teaching in the rejection of claim 65, Yaple, the explanation of why one of ordinary skill would be motivated to add second drive and

actuation system to Hogan is stated as "for the purpose of providing an actuator comprising at least three telescoping members which allows for additional length of actuation" (as stated in Yaple C4/L1-33). The use more stages in an actuator yields the predictable result of increasing total actuation distance and would indeed have been obvious to one of ordinary skill at the time the instant application was filed.

Regarding subsection D, explanations of the combination being made has indeed been provided to the Appellant. In the teaching in the rejection of claim 66, Laskey, the explanation of why one of ordinary skill would be motivated to make the outer tube out of aluminum is stated as "for the purpose of providing a material suitable for the load." One of ordinary skill in the art would be motivated to make the outer tubular body out of any material suitable for the desired design and operation characteristics of the actuator, one of which is load conditions. As shown in the Laskey reference, aluminum is a known material to make the tubular bodies of an actuator, see column 3 lines 8-19.

Appellant argues in section III that no explanation for the conclusion of obviousness has been provided and therefore no prima facie case of obviousness has been made in relation to claim 60.

An explanation of the combination being made has indeed been provided to the Appellant. In the teaching in the rejection of claim 60, the explanation of why one of ordinary skill would be motivated to relocate the spring between different elements in Hogan is stated as a "rearranging" of the location of the spring that would have been obvious to try to one having ordinary skill in the art. In addition it is also stated that

moving the particular location of the spring in Hogan would yield the predictable result of subjecting the balls to a radial thrust against the outer tube as it currently does in the Hogan since the location of the spring will still act to bias the disks toward each other.

Appellant argues in section IV subsection A that there is no T/S/M provided in the prior office action for the combinations being made in relation to claims 53-59, 61-65.

As stated above in rejection and the first section under the response to arguments T/S/M is found explicitly in the prior art used for claims 53-59, 61-65. Specifically, Brusasco states that the purpose of using helical races is to assure the pitch movement of the balls and the moving body are correct (see Brusasco, C1/L48-52), Barrett states that the purpose of using an internal motor is to provide an actuator that has a low manufacturing cost, simple construction and an extremely low capacity coupling with ground with a high leakage resistance to ground (see Barrett, C1), Halasy-Wimmer states that the purpose of using an internal member with the helical race inside an outer tube is to provide a device with considerable reduction in manufacturing costs due to non-cutting fabrication (see Halasy-Wimmer, paragraph 0004), Yaple states that the purpose of using multiple actuation stages is to provide an actuator comprising at least three telescoping members which allows for additional length of actuation (see Yaple, C4/L1-33). The T/S/M for the use of aluminum as the material for the outer tube, as shown in Laskey, is implicit. The implicit rationale is that one of ordinary skill in the art would be motivated to make the outer tubular body out of any material suitable for the

desired design and operation characteristics of the actuator, one of which is load conditions.

Appellant argues in section IV subsections B-E that the purposed modification to Hogan renders Hogan unfit for its intended purpose and changes the principles of operation and that Hogan teaches away from using ball races in the outer tubular body.

Hogan does not teach away from the use of ball races in the outer tubular body. Appellant relies on column 1 lines 20-35 of Hogan which states why Hogan does not used ball races in the outer tubular body as traditionally done in the prior art. This section, nor does any other section of Hogan, state that the nut formed of stacked disks can not be used with threads. Hogan uses the particular arrangement with no defined grooves allow for pitch adjustment to vary the speed, but one of ordinary skill in the art would relies that a fixed pitch, define helical grooves in the outer member, can be used with a gear reduction unit to vary the speed as used in the prior art discussed by Hogan in column 1 lines 20-35. Adding the fixed helical races in the outer member does not make Hogan unfit for the intended purpose of actuation nor does it change the principles of operation, one rotary member driving a member movable in along a linear displacement, since the device of the combination will still act to actuator a member through a rotary drive and a linear displaceable member. In addition a ball against flat surface versus a ball in a groove both rely on friction between the ball and the surface the ball is resting on to create the movement, without a frictional engagement there would be no movement. Since friction is present in both a groove configuration and a

non-groove configuration the device of Hogan and the device of the combination have the same principle of operation in this finite analysis.

In subsection D Appellant focuses on the "plastic deformation [distortion]" limitation found in dependent claim 63. The tightening of the nut in Hogan will force the balls against the inner wall of the outer tube with increasing force which would lead to plastic deformation of the outer tube to create a small but functioning groove, such an arrangement is similar to Appellant's Figure 1. Also, the method of forming the groove is a product-by-process limitation that does not structurally define the apparatus claim (MPEP 2113). In the combination of Hogan in view of Brusasco the defined thread/groove of Brusasco could be formed by any method, including plastic distortion, milling or molding, and result in the same structure, a groove, being recited in the claim.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/JAMES PILKINGTON/

Examiner, Art Unit 3656

Conferees:

/Richard WL Ridley/

Supervisory Patent Examiner, Art Unit 3656

/MJ/ Marc Jimenez TQAS TC 3600

